

**First Report**  
**Of the**  
**Standing Technical Committee**  
**On Indices of Input Costs**



**November 1967**

**Department of Agriculture**

**Ministry of Food Agriculture, Community Development  
and Cooperation**

**Government of India**

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## CHAPTER I

### INTRODUCTION

1.1. The Standing Technical Committee on Indices of Input Costs has been constituted by a Resolution\* of the Government of India (Department of Agriculture) in February, 1967, for the purpose of providing "necessary guidance in organising the collection of data on indices of input costs and also in organising cost of production surveys on an integrated basis." The composition of the Committee is as follows :

1. Dr. Ashok Mitra, (Chairman)  
Chairman,  
Agricultural Prices Commission.
2. Shri J. S. Sarma,  
Economic & Statistical Adviser,  
Ministry of Food, Agriculture, C.D. & Cooperation.
3. Dr. G. R. Seth,  
Statistical Adviser,  
Indian Council of Agricultural Research.
4. Dr. A. B. Joshi,  
Deputy Director General,  
Indian Council of Agricultural Research
5. Dr. S. Chakravarty,  
Professor of Mathematical Economics,  
Department of Economics,  
Delhi University.
6. Dr. A. S. Cheema,  
Agricultural Production Commissioner,  
Ministry of Food, Agriculture, C.D. & Cooperation.
7. Dr. K. Kanungo,  
Head of the Division of Agricultural Economics,  
Indian Agricultural Research Institute.
8. Shri R. N. Kaushik, (Convenor)  
Additional Economic & Statistical Adviser,  
Directorate of Economics & Statistics,  
Ministry of Food, Agriculture, C. D. & Cooperation.

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\*Appendix I gives the text of the Resolution.

1.2. The following are the terms of reference of the Committee, as laid down in the Resolution of the Department of Agriculture :

1. To advise on issues connected with the formulation of indices of input costs for sugarcane and other agricultural commodities, likely to be useful in forming judgements on questions of price policy;
2. To examine the available data on cost of production of sugarcane and other agricultural commodities, collected through Farm Management Studies and other surveys, and to make suggestions for bringing, whenever necessary, the available data up-to-date on the basis of *ad hoc* judgements and through quick additional surveys;
3. To advise on the scope and design of future surveys of cost of production, proposed to be organised on a coordinated basis in different parts of the country, with due regard to the requirements of constructing the indices of input costs;
4. To advise on any other matters relating to collection and utilization of data on cost of production of agricultural commodities, as may be referred to it by the Ministry of Food, Agriculture, Community Development and Cooperation.

1.3. The Committee held its first meeting on the 20th March, 1967. On this occasion, it considered, in a general way, the types of data on cost of production needed for formulating agricultural price policy, the various technical issues connected with the collection and analysis of such data and the building up of indices of input costs. It set up the following four Sub-Committees for consideration of some of the important issues in detail :

Sub-Committees	Members
1. Sub-Committee on Conceptual Issues . . .	1. Dr. S. Chakravarty 2. Dr. K. Kanungo
2. Sub-Committee on Indices of Input Costs . . .	1. Dr. Ashok Mitra 2. Dr. S. Chakravarty
3. Sub-Committee to examine the Results of Past Surveys	1. Dr. A. S. Cheema 2. Dr. G. R. Seth
4. Sub-Committee on Scheme for Future Surveys .	1. Dr. A. S. Cheema 2. Dr. A. B. Joshi 3. Shri J. S. Sarma

1.4. The Committee considered the suggestions of the Sub-Committees at its meeting held on May 30, 1967. It also considered the Scheme for the Study of Cost of Cultivation of Principal Crops in India, prepared by the

Institute of Agricultural Research Statistics (I.A.R.S.) in the light of the suggestions of the Sub-Committee on Future Surveys. The Committee held another meeting on September 11, 1967, to finalise its views. The Committee recommended modifications in the Scheme prepared by the IARS, taking into view the comments on the Scheme received from some of the experts, and desired the I.A.R.S. to revise the Scheme. In order to have some data on cost of production in the interim period, that is, till the data under the IARS scheme become available, the Committee recommended the extension of the coverage of the Indicator's Scheme, conducted by the Directorate of Economics and Statistics in the districts where Farm Management Studies have been completed, and of the Scheme relating to Index Numbers of Cost of Cultivation of Sugarcane, organised by the Regional Office, Sugarcane Development, under the technical guidance of the I.A.R.S., in the areas covered by the Study of the Cost of Cultivation of Sugarcane. The Committee also recommended that a Scheme for constructing the Index of Cost of Cultivation of Cotton on the basis of the survey carried out by the Indian Council of Agricultural Research may be prepared by the I.A.R.S. and put into operation.

#### **Plan of the Report**

1.5. An attempt has been made in this Report to discuss the present position about the availability of data on cost of production of principal crops as well as the conceptual issues involved in the collection and analysis of data and to present the views of the Standing Technical Committee on these and cognate issues. The Report is divided into four main sections, dealing respectively with (i) the need for data on Cost of Production, (2) the present state of data, (3) deficiencies in existing data and (4) suggestions for the extension of the Indicator's Schemes and for future surveys of cost of cultivation of principal crops.

## CHAPTER II

### NEED FOR DATA ON COST OF PRODUCTION

2.1. With sustained efforts at planned development of agriculture involving introduction of improved technology, the need for data on cost of production of principal crops is being increasingly felt both for policy formulation and for organising extension work. Adequate knowledge of the cost structure of principal crops is essential for working out schemes for providing adequate incentives to the farmers. To implement the policy of guaranteed minimum prices of agricultural commodities, it is necessary to have an idea of the cost of production of different crops. The lack of such data becomes an inhibiting factor in policy making. In its Report on price policy for kharif cereals for the 1965-66 season, the Agricultural Prices Commission had observed : "The Commission would have liked to use estimated cost of cultivation as a guiding criterion for determining the minimum price, but there are many gaps in the available farm cost data. The Commission would like to emphasise that it is essential that immediate steps are taken to collect reliable and comprehensive cost data so that scientific guidance for determining the minimum prices becomes available as quickly as possible." (page 2). Besides being necessary for fixation of prices of agricultural products, the data on the structure of costs are essential for taking decisions on fair prices of agricultural inputs.

2.2. When efforts are being made to bring about a rapid change-over from traditional methods of cultivation to more scientific farming, the data on cost have relevance for extension work. The risk-bearing capacity of the farmers being limited, they are generally reluctant to adopt either improved technology or new varieties, unless they are convinced of their economic feasibility. Cost studies showing the differences between the economics of the improved technology and of the traditional methods have, therefore, a key role to play. Systematic assessment of the economics of the adoption of improved practices thus emerges as an acute social need. To the individual farmers themselves, data on cost are of special interest inasmuch as they reveal the input-output relationship of their enterprises and bring out the differences in unit cost between the less efficient and the more efficient farms. Such being the importance of these data, it is necessary that they should be comparable as between different States. For ensuring this comparability, a certain degree of uniformity in the concepts and methodology adopted for the collection and analysis of these data in the different States and regions ought to be achieved.

2.3. It is important to have data on cost of production in respect of all the principal crops for which the policy of minimum guaranteed prices is

being implemented. In a vast country like India, marked by disparities in agricultural conditions, it is necessary that data on cost are made available on regional basis. As price decisions are taken at the State levels, it is appropriate to have these data separately for the different States. Information about variations in cost of production is required on a continuous basis to help in the fixation of prices of particular commodities from year to year. As the technological base is undergoing rapid transformation, the schedule of costs also is changing; it is vital that these changes are recorded with speed and accuracy. Collection of such data, however, involves considerable cost, effort and time. An important point to consider, therefore, is whether once the basic data are collected, the variations in costs occurring as a result of changes can be determined through the construction of index numbers or a system of sample checks.





## CHAPTER III

### STUDIES FOR COLLECTION OF COST DATA

3.1. The period since Independence has seen a growing volume of effort by different agencies in the country to collect data relating to cost of production of various agricultural commodities. Agencies like the Indian Council of Agricultural Research (ICAR), Commodity Committees, the National Sample Survey (N.S.S.), the Directorate of Economics and Statistics, Ministry of Food and Agriculture, the State Governments, Universities and Research Institutions have tried to carry out or sponsor studies aimed at the collection of information regarding cost of production of various crops. Appendix II gives some details about the various studies undertaken so far. These efforts, however, have beyond a point lacked central direction and coordination. Consequently they have tended to differ in their scope, coverage, methodology and concepts. They have, however, helped to focus attention on some of the more important issues involved in the estimation of cost of production of agricultural commodities.

#### **Studies Organised by the I.C.A.R. and Commodity Committees**

3.2. The Cost Studies conducted under the auspices of the I.C.A.R. during 1933-34 to 1936-37 in the principal sugarcane and cotton growing tracts of India constituted perhaps the first systematic effort in the direction of studying the economics of crop production. The main objective of this Survey was to collect data relating to cost of production of sugarcane in the country and to decide the area in which the sugar industry had the best chance of development. The Survey also covered other principal crops grown in the selected regions and was spread over a period of three years.

3.3. During 1952-53, the I.C.A.R. in collaboration with the Indian Central Cotton Committee and the Indian Central Oilseeds Committee carried out a pilot study into the cost of production of cotton and its rotation crops in the district of Akola. The objective of the pilot study was to provide guidance on such methodological problems as the sampling design, sampling units and method of recording data.

3.4. The scope of the cost studies organised under the auspices of the I.C.A.R. has been gradually widened. The Indian Central Sugarcane Committee of the I.C.A.R. sponsored studies on cost of production of sugarcane in four major sugarcane growing States viz., U.P., Bihar, Andhra Pradesh and Punjab during 1955-56 to 1957-58 covering 23 districts in U.P., 7 in Bihar, 5 in Andhra Pradesh and 3 in Punjab. The studies were further extended to Maharashtra and Mysore in 1956-57 and 1960-61 respectively, covering 5 districts in each State. On the basis of the results of the Akola Pilot study, the I.C.A.R. and the Cotton and Oilseed Committees jointly

organized a study of the cost of cultivation of cotton and its rotation crops (jowar, wheat and groundnut) in the principal cotton tracts, viz. Punjab, Maharashtra, Gujarat and Mysore, covering the period 1960-61 to 1962-63. The study covered four districts in Punjab, six in Maharashtra, seven in Gujarat and three in Mysore.

3.5. A three-year study on the cost of production of jute and its competing crop, namely paddy, in West Bengal, Bihar and Assam, sponsored by the erstwhile Indian Central Jute Committee in 1963-64, is nearing completion. An interim report on the basis of the results of the first two years has been prepared and the analysis of the data collected during the third year is in progress at the I.A.R.S.

#### **Surveys carried out by the N.S.S.**

3.6. The National Sample Survey conducted an enquiry on some aspects of cost of cultivation of paddy, wheat, jowar, bajra, barley, maize, ragi, gram, small millets, groundnut, cotton, jute, minor cereals, pulses, sugarcane, oilseeds, potato, spices and tobacco during its fifth (December '52-March '53), sixth (May-September '53) and seventh (October '53-March '54) rounds. The number of households covered in these rounds was 4,287, 4,388 and 3,144 respectively. The entire country, except Jammu and Kashmir and the Andaman and Nicobar Islands, was covered by the Survey. The National Sample Survey subsequently undertook another survey on some aspects of the cost of cultivation of important crops in their eleventh round of investigations (August 1956—February 1957) covering the same crops as in the earlier investigations. The survey covered the entire country except Andaman & Nicobar Islands, the North East Frontier Agency and the Naga Hills.

#### **Farm Management Studies**

3.7. A comprehensive programme of Farm Management Studies was launched by the Directorate of Economics and Statistics, Ministry of Food and Agriculture, in collaboration with the Research Programmes Committee of the Planning Commission in 1954-55. These studies were initiated in 1954-55 in five regions in the States of Punjab, U.P., Madras, West Bengal and Maharashtra and were extended in the following year to one more region in Maharashtra. The objective of the Study was two-fold : to obtain guideline data for formulating agricultural policy and for extension work, and to determine the relative merits of the cost accounting and survey methods for collection of data on cost. The Studies provided data on cost for major crops grown in the concerned regions, viz., paddy, maize, wheat, jowar, bajra, sugarcane, cotton, groundnut, etc. as well as on other aspects of the farm economy such as cropping pattern, the relative profitability of the different crops grown on the farm, farm investment, and return to the farm business, human and bullock labour employment, etc.

3.8. The Studies were later extended by the Directorate of Economics and Statistics to more regions in the country, covering selected areas in Andhra Pradesh, Bihar and Orissa during 1957-58, Bihar during 1960-61, Punjab during 1961-62 and Madhya Pradesh, Mysore, Rajasthan and Kerala during 1962-63. Further studies have been initiated recently, enlarging the coverage in U.P., Gujarat, Madras, Punjab, Maharashtra, Andhra Pradesh and Orissa. Of these recent Studies, some are in the nature of repeat surveys. Steps are being taken to start the Study in one of the districts in Assam during the current year. These recent Studies, while retaining the objective of collecting farm management data on the pattern of the past studies, also aim at providing information on the economics of improved agricultural practices.

#### **Studies conducted by the State Governments and Local Bodies**

3.9. Some of the State Governments and local organisations have also carried out surveys to collect data on cost. Information in respect of some of these surveys is given below :

- (i) The Government of Punjab conducted an enquiry into the cost of production of crops during 1951-52 to 1955-56 covering wheat, gram, cotton, maize, paddy and sugarcane crops.
- (ii) The Government of Assam conducted a survey for the study of indebtedness among the cultivators during the year 1963-64. Some data on cost of production of jute and paddy crops were also collected.
- (iii) In Bihar, a survey of 108 holdings in 6 villages was conducted during 1962-63 for studying the cost of cultivation of crops. This study covered paddy, wheat, maize, gram and potato crops.
- (iv) The West Bengal Government conducted a study on Farm Management and Cost of Production during 1962-63 and 1963-64. Data on cost of cultivation of paddy, jute, sugarcane, potato, wheat etc. were collected from 120 holdings.
- (v) The Government of Uttar Pradesh conducted a study of cost of production of peas, gram, wheat, sugarcane (gur), paddy and barley during 1964-65 on 320 holdings in the Ghazipur and Azamgarh districts.
- (vi) In Andhra Pradesh, a study of the cost of production of paddy, jowar, ragi, sugarcane and groundnut, was conducted during January, 1962 to December 1964, covering 540 holdings in three selected districts.
- (vii) In Madras, a survey of cost of production of rice was conducted in the Thanjavur and Coimbatore Districts during 1962-63 and 1963-64.

3.10. Reports are available only in respect of the studies undertaken in Punjab, Assam, West Bengal and Andhra Pradesh. No detailed information is, however, available on the design, concepts and definitions adopted or the method of collection of data in respect of most of these studies.

### **Composite Demonstration Data**

3.11. Some data on cost of production of "progressive" farmers are available from the records of Composite Demonstration organised in the districts covered under the Intensive Agricultural District Programme. The data give estimates for two categories, namely 'control' costs and income and 'demonstration' costs and income, together with the yields in the two categories of plots. The costs relate to operational expenses only and do not include fixed costs. In West Godavari (Andhra Pradesh) and Thanjavur (Madras), the Farm Management Specialists, appointed under the I.A.D.P., have been maintaining, for some years, farm records of the various farmers in the district. The records contain data on the input-output structure for the farm as a whole. Data on the various "enterprises" are not separately recorded.

### **Farm Record Projects**

3.12. With a view to obtain cost of production data under the improved levels of farm technology, the Agricultural Prices Commission in collaboration with the Directorate of Extension initiated a Farm Record Project in all the 15 I.A.D.P. Districts during 1966-67. A Farm Record Book has been designed in consultation with the Directorate of Extension and the Farm Management Specialists of the I.A.D.P. Districts. The Record Book provides for collection of such data as would enable the Commission to get an estimate of the average cost of the important crops in each I.A.D.P. District. Data are being collected only from the so-called "progressive" farmers. A "progressive" farmer has been defined as one for whom farm plans have been prepared and actually implemented for the past three years. Equal representation is being given to the small, medium and large farmers in the sample in each district.

## CHAPTER IV

### DEFICIENCIES IN THE EXISTING DATA

4.1. As mentioned in the previous chapter, a number of surveys have been carried out in the different regions in the country to collect information on cost of production of various crops. The Farm Management Studies too *inter alia* give information about cost of production of various crops. These Surveys and Studies carried out at different times with diverse objectives by different agencies have not followed uniform concepts and do not provide information for all the major crops on a comparable basis. Most of them were not specifically designed to collect data on cost with a view to formulating price policy at the national and State levels.

4.2. The coverage of the Farm Management Studies, sponsored by the Directorate of Economics and Statistics, is confined to one or two selected districts, representing a typical soil-crop complex in each State covered by these Studies. Thus, although these Studies give detailed data in respect of the inputs and outputs for the different crops cultivated and for other enterprises carried out on sample farms, the data cannot be regarded as representative of the States covered. The sampling design followed for these Studies until 1966-67 was such that small farms received greater weightage, despite their relatively limited importance insofar as marketable surplus is concerned. This deficiency sets a boundary to the usefulness of the cost data collected under these Studies in connection with the formulation of price policy. The sample design has been modified in the case of the Studies taken up under the Fourth Five Year Plan so that a part of this defect could be removed.

4.3. The Studies carried out by the I.C.A.R. are aimed at studying the cost of cultivation of particular crops. They generally cover crop tracts extending over several States. As such, these Studies are more comprehensive from the point of view of area coverage than the Farm Management Studies. However, their results are also subject to many limitations. In the earlier Studies relating to cost of cultivation of sugarcane, attention was concentrated only on sugarcane. In the more recent Studies relating to cost of cultivation of cotton, an attempt has, however, been made to collect information about cotton as well as its rotation crops. Although the I.C.A.R. Studies are designed to provide estimate of cost for a State as a whole, holding-wise information about the output of crops has not been recorded for all the holdings under each Study and for all the years. In the case of cotton and its rotation crops, cost estimates have been presented separately for small, medium and large farms. However, the classification adopted for categorising the farms into small, medium and large is such that the upper limit for the small farms

is itself very high, being around 15 acres. There is also considerable disagreement about certain imputation procedures adopted for these Studies.

4.4. The N.S.S. Studies have covered different regions without any particular reference to the crop complex or crop tracts having predominance of particular crops. The data collected under these Studies would be of limited use for price policy, as these Studies cover only certain aspects of cost of cultivation. The household has been used as the sampling unit in these Studies, whereas the holding is a more appropriate sampling unit for getting reliable data on cost of cultivation. Moreover, the N.S.S. Studies have relied primarily on the "survey" method for the collection of data, which has considerable memory bias and is not generally regarded as a reliable method for the collection of data on cost of cultivation of particular crops.

4.5. The Cost of Production Surveys conducted by the State Governments and local organisations, have limited coverage and scope and are meant to provide answers to specific local problems.

4.6. In order that the estimates of cost of production may be useful for price policy, it is necessary to decide about the components of cost that will be relevant from this point of view. Concepts of costs used in the various Studies are somewhat different. Some of these concepts are indicated in Appendix III. The following four concepts have been used in the Farm Management Studies :

*Cost A<sub>1</sub>*—Cash & kind expenses (or paid out costs) actually incurred by owner operator. These include cash and kind expenditure on items like hired human labour, owned and hired bullock labour, seed, manure, fertilizers, land revenue and cess, irrigation charges, depreciation charges of implements, machinery and buildings and interest on crop loans.

*Cost A<sub>2</sub>*—Cost A<sub>1</sub>+rent paid for leased-in land.

*Cost B*—Cost A<sub>2</sub>+rental value of owned land and interest on owned fixed capital excluding land.

*Cost C*—Cost B+imputed value of family labour.

4.7. In the Studies of Cost of Production of Sugarcane and Cotton sponsored by the erstwhile Commodity Committees of the I.C.A.R. too, varying concepts have been used, which differ from those used in the Farm Management Studies. These divergencies are still wider for the Studies sponsored by the State Government.

4.8. In addition, there is lack of uniformity between the various Studies also in regard to procedures for evaluation. For example, differences in procedures for evaluating family labour are observed between the Farm Management Studies and the Cost of Cultivation Studies carried out

by the I.C.A.R. and the erstwhile Commodity Committees. The cost of family labour constitutes a considerable part of the total cost of an average Indian farm. In the Farm Management Studies, the family labour has generally been evaluated according to the wages paid to permanent farm servants; under the I.C.A.R. Studies, going casual labour rates in the respective regions have been adopted for the purpose. The N.S.S. Studies do not seem to have included family labour as an element of cost.

4.9. Similarly, different procedures have been adopted insofar as imputation of managerial allowance is concerned. While the Farm Management Studies do not make any allowance for managerial responsibilities, in the Studies carried out by the Sugarcane Committee, allowance for managerial responsibilities has been provided on the following basis :

- (i) The imputed value of labour put in per acre of sugarcane per adult male family member. (This is intended to compensate the farmer for different kinds of work off the field);
- (ii) Plus 10 per cent of gross income from produce. (This is to remunerate the farmer for the managerial responsibilities undertaken by him).

4.10. In the Study of Farm Management and Cost of Production conducted by the Government of West Bengal, allowance for management has been imputed at the rate of 7 per cent of the costs incurred.

4.11. The Agricultural Prices Commission has commented that while multi-stage stratified random sampling design has been adopted for the Farm Management Studies, the estimates of cost are not properly weighted. Analysis of the data as collected is not geared to provide answers to the specific issues relevant to the task of taking decisions about prices either. For instance, not all the Farm Management Reports present data on the frequency distribution of farms by categories of cost. The estimates of expenses actually incurred in cash are not available in all the Studies. The Studies carried out by the I.C.A.R. suffer from similar limitations. They do not give information on frequency distribution by cost classes, nor on relationships between different costs and size of farms. The estimates of crop yields are based on crop-cutting experiments wherever such data were considered adequate and on unofficial estimates of production in other cases. Holding-wise production data are generally not available.

4.12. A general limitation of all the cost studies carried out so far is that they do not give estimates of cost of production according to varieties of crops and according to the type of technology used.

4.13. The other serious difficulty arises from the fact that the data were collected at different points of time and in several cases may have become out of date. The first series of Farm Management Studies was carried out

as far back as 1954-55 to 1956-57, and further studies have been undertaken at varying periods in different regions in the country, with the result that their results are neither strictly comparable nor can they be aggregated. The Studies carried out by the N.S.S. mostly relate to the period 1951—53, the data obtained are likely to have become obsolete by now. The same difficulty is met with in the case of the Studies carried out by the other agencies and the State Governments.

4.14. In order that comparable data on cost for various regions and crops in the country would be made available in future, certain basic issues must first be resolved. The data should be such that would fulfil the requirements for the formulation of price policy. Some of the issues needing consideration in this connection are the objectives of the price policy, the recognised components of cost, the agency whose cost should be taken into account and the level to which the estimates should pertain *i.e.* State, Region, etc.

4.15. The objectives of agricultural price support policy can be and have in fact been diverse in different countries. In the main, the price support policy can be either income-oriented or production-oriented. While in our present conditions the requirements of production have to be given a high priority, it would still be necessary to keep in view the interests of small farmers. Another issue posed sometimes is whether in formulating price policy, we are concerned with (i) the relative profitability of agriculture as a whole *vis-a-vis* other sectors, or with (ii) the allocation of resources between the various crops at a given time. These alternatives, in a way, represent long-term and short-term objectives. While in the long run resource shifts might take place between agriculture and the other sectors of the economy, in the short term resource shifts might take place only between crops.

4.16. Another important issue is (i) which costs and (ii) whose costs are relevant for determining price policy. As indicated above, different concepts of costs have been used in the Cost of Cultivation and Farm Management Studies carried out so far. A view has been expressed that only the 'paid-out costs' should be taken into consideration while determining minimum support prices; on the other hand some other interests have strongly argued that the total cost (Cost 'C' of the Farm Management Study) should form the basis of minimum support prices. It has also to be recognised that "purchasable physical inputs", *viz.*, interest on capital—working or fixed—employed and other essential tariffs like irrigation rates and land revenue, are important elements of cost. Whereas the concept of the marginal variable cost would be relevant for price policy in the short term, fixed capital is an important factor in the long run; it might be necessary to determine how much of the national capital is of the fixed type. While working out the cost estimates for the individual crops, it would also be



necessary to keep in view the elements of joint cost, since the fixed cost incurred on different items such as land shaping, bunding and irrigation channels would be distributed over the different crops.

4.17. Allowances for family labour and managerial skill, as mentioned above, have been treated differently under the different Studies conducted in the past. While economists in general maintain that it is essential to make allowance for family labour in the estimation of cost, there is a view that it would be unrealistic to do so, since the particular cost of family labour is in most cases likely to be marginal or nil. The controversy boils down to specifying the opportunity cost of family labour. A further problem is the rate at which the family labour should be evaluated. The inclusion of family labour also gives rise to the peculiar dilemma that the higher the cost the higher is the income since part of the cost is income. The Committee, however, does not consider it necessary to make a separate provision for managerial allowance. Any profits earned by the farmer over and above the normal cost would represent the compensation for his managerial responsibilities.

4.18. The other problems relate to yet other components of cost and the procedures for their imputation. Very few of the inputs used in agriculture are standardised. Extreme variations in the quality of inputs such as land, bullock labour, seeds, etc. can be noticed; yet these inputs are generally treated as homogeneous in quality.

4.19. A basic issue involved in the computation of cost for the fixation of prices is the determination of the parties, whose cost of production should be taken as the basis for price fixation. Three types of cost estimates have been suggested as relevant :

- (a) The average cost of all farmers;
- (b) The average cost of the efficient farmers; and
- (c) The bulk-line cost.

Of the above approaches the first has some merits as well as limitations. The concept of average cost of all farmers, has relevance for price determination only if the variance in costs is not too wide. In case the inter-farm variance is very large, a majority of the farmers may have costs higher than the average. The argument advanced for linking price to the average cost of the efficient farmers is that it should be the objective of price policy to reward efficiency. However, in order to translate this approach into practice, the question of defining the efficient farmers has to be satisfactorily resolved. Efficiency is by definition a relative concept. Various measures of efficiency have been employed in the Farm Management Studies. Efficiency can be viewed from the point of view of the efficient use of land resources,

or that of labour or capital. Efficiency can also be measured by the degree of correspondence between marginal productivities of these inputs and their respective prices. Again, the question of efficiency of resources used in relation to a particular activity on the farm can be differentiated from the efficiency of the resources used for all types of activities on the farm. Further, it may also be necessary to distinguish between economic efficiency and technological efficiency.

4.20. Another approach suggested is that bulk-line cost should be taken into account for price fixation. The bulk-line cost has been defined as that cost which would cover, say, the cost of producing 85% of the total output. Assuming that the farms are arranged in an ascending order by reference to the unit costs of production, the bulk-line cost is the marginal cost of producing the 85th unit of total output. The main difficulty in this case is that of the divergence in the cost estimates when the 85% coverage concept is applied exclusively to production, ignoring the coverage of the area under the crop or the number of holdings. It is likely that the bulk-line cost as related to output may not cover the cost of production for a significant proportion of the holdings. The Committee is not in favour of using bulk-line cost relating to a specified percentage of production, area or number of farmers as the basis for estimation of cost. Since the notion of marginal implied in this case is related to demand, which is likely to vary over time, the Committee feels that a more suitable approach would be to forecast the demand and then to determine the marginal cost of the supply, which would meet the demand. The basic question involved is to determine the likely level of marginal cost involved for achieving the production targets of particular crops in the different States and regions in the country.

4.21. It may be that in deciding upon the elements of price policy, different approaches may have to be followed under different situations over a period of time. This would indicate the need for collecting the maximum possible information about cost of production. It would be necessary to cover all types of farms and study the relationship between farm-size and the cost of production. It may be left to the agency responsible for formulating price policy to decide as to what type of data it would use.

4.22. Another basic question in formulating estimates of cost is the level to which these estimates should pertain, *i.e.*, whether they should be on District, State or Regional basis. As the major policy decisions are taken at the State levels, it may be necessary in due course to have State-wide estimates. In case conditions differ significantly within a State, separate estimates may be required also for different regions or districts in the State. All-India estimates would still be needed to obtain a broad picture of the variations occurring in the costs of particular crops in the country as a whole.

## CHAPTER V

### INDICES OF INPUT COSTS

5.1. Cost Studies involve considerable expenditure and are time-consuming. Where such studies cannot be repeated each year, it may be felt necessary to construct indices of input costs on the basis of input prices. Attempts to build such indices are being made by the Directorate of Economics and Statistics through their Scheme of Indicators in the Sphere of Agricultural Economy and by the Regional Office, Sugarcane Development, under the technical guidance of the I.A.R.S., through their Scheme for Index Numbers of Cost of Cultivation of Sugarcane.

#### Indicator's Scheme

5.2. The Directorate of Economics and Statistics have initiated the Scheme for building indicators in the regions where Farm Management Surveys have been completed. Data on input-output relationships, cost of cultivation and cost of production of individual crops, farm business cost, etc. have been collected under the Farm Management Surveys. The Indicator's Scheme is designed to keep some of these data up-to-date. The approach broadly consists of working out a series of indices with the help of data collected under the Farm Management Studies, which are used as base, and the data for the subsequent period in respect of various inputs, which are collected regularly from a sub-sample of selected villages.

5.3. The Indicator's Scheme is in operation in 9 regions in the country and steps are being taken to introduce it in 4 more regions. These regions are as follows :

Regions/Districts covered under the Farm Management Studies and the Indicator's Scheme	Years in which Farm Management Surveys were carried out
1. Amritsar & Ferozepore (Punjab)	1954-55 to 1956-57
2. Meerut & Muzaffarnagar (U.P.)	Do.
3. Salem & Coimbatore (Madras)	Do.
4. Hooghly & 24-Parganas (West Bengal)	Do.
5. Ahmednagar & Nasik (Maharashtra)	Do.
6. Akola & Amraoti (Maharashtra)	1955-56 to 1956-57
7. West Godavari (Andhra)	1957-58 to 1959-60
8. Sambalpur (Orissa)	Do.
9. Monghyr (Bihar)	Do.
10. Shahabad (Bihar)*	1960-61 to 1962-63
11. Pali (Rajasthan)*	1962-63 to 1964-65
12. Raipur (Madhya Pradesh)*	Do.
13. Alleppey & Quilon (Kerala)*	Do.

\*—Scheme to be started in these Regions during the current year.

5.4. In each region, a sub-sample of four villages has been selected for collecting data for the Indicator's Scheme out of the original sample villages, which numbered 20 in each of the six regions taken up first and 10 in each of the other regions covered subsequently under the Farm Management Studies. In the selected villages, the same holdings (10 per village) as were covered under the Farm Management Studies have been retained for the purpose of the Indicator's Scheme. Information pertaining to various aspects of farm economy, such as, prices of inputs, output, prices received, quantities marketed, stocks, employment and farm inventory, is being collected on a regular basis (weekly, monthly or annually). The agency for the collection of this information consists of a village reporter in each village, who is given an honorarium of Rs. 30 per month and a Research Investigator (Gr. II), Technical Assistant and a Computer sanctioned for each region.

5.5. The Directorate of Economics and Statistics have taken up construction of the following 14 Index Numbers on an experimental basis, which fall broadly under five groups :

**Group I**

- (1) Index Numbers of Cost of Cultivation—Major Crops.
- (2) Index Numbers of Farm Cost.
- (3) Index Numbers of Wages of Field Labourers.
- (4) Index Numbers of Bullock Labour Cost (hiring charges).
- (5) Index Numbers of Farm Prices.

**Group II**

- (6) Index Numbers of Cost of Production—Major Crops.

**Group III**

- (7) Index Numbers of Farm Employment.
- (8) Index Numbers of non-Farm Employment.
- (9) Index Numbers of Total Employment.

**Group IV**

- (10) Index Numbers of Farm Prices Received.
- (11) Index Numbers of Gross Value of Farm Produce.

**Group V**

- (12) Index Numbers of Quantity Marketed—Major Crops.
- (13) Index Numbers of Stocks at the end of the month.
- (14) Index Numbers of Quantities Marketed as Percentage to Stocks at the end of the month.

5.6. The Indicator's Scheme, taken up hitherto on an experimental basis, suffers from a number of limitations. In order to be sufficiently reliable the data have to be based on a representative sample of adequate size. A sub-sample of four villages in each region is, however, hardly adequate. The Committee strongly feels that the sub-samples should be enlarged. The weights used in constructing the indices are based on the Farm Management Surveys, which were carried out about a decade ago in several regions. The assumption about the constancy of the weights may not hold good for long in a situation where intensive efforts are being made to improve agricultural practices and new inputs like fertilizers, improved seeds, pesticides, better irrigation facilities, are being propagated. Further, due to paucity of data for the base period, some of the indices, such as, indices of wages and bullock labour costs are 'simple' indices, and not 'weighted' indices. The index of cost of cultivation takes into account the variations only in four components, viz., wage rate, hiring charges of bullocks, prices of seeds and ammonium sulphate and not the other inputs. Due to lack of adequate data in the Farm Management Studies, it has not been possible to base the index of bullock labour costs on the maintenance costs of bullocks, but is constructed on the basis of hiring charges of bullocks for major operations or, where hiring of bullocks is not common, on the prices of feed grains, such as, wheat, gram, etc., fed to cattle.

5.7. The Technical Committee on Index Numbers had observed that "the sample under the Indicator's Scheme was too small and should be enlarged to cover all the sample villages of the Farm Management Studies". It also recommended that the same farmers should not be approached and a fresh sample of cultivators might be taken in the successive period. The Standing Technical Committee is in agreement with these views and recommends extension of the coverage of the Scheme to all the villages under the Farm Management Studies.

5.8. As regards the Index Numbers pertaining to different items, the Committee suggests that the following three Index Numbers should also be constructed in addition to the indices pertaining to the cost of cultivation already being constructed :

- (1) Index Numbers of Prices of Material Inputs.
- (2) Index Numbers of Prices received by the Farmers for Agricultural Commodities.
- (3) Index Numbers of Prices paid by the Farmers for Industrial Consumers' Goods.

5.9. The Index Numbers of prices paid by the farmers for industrial consumers' goods would be helpful in forming an idea about the variations in the real incomes of the cultivators. The schedules used presently under the Indicator's Scheme already include a number of consumption items

like cloth, food articles and fuel. The Directorate of Economics and Statistics may examine this list with a view to rationalisation and inclusion of other important items. As regards the weights to be used for the construction of these index numbers, the available N.S.S. data may be looked into and, if necessary, a quick bench-mark survey may be carried out in the selected areas. Whatever procedure is adopted, it should be followed uniformly in all the selected regions.

5.10. The Committee has also considered the question of bringing the existing weighting diagrams for the construction of indices of input costs in various regions up-to-date. Out of 13 regions covered under the Indicator's Scheme, repeat surveys have already been initiated in 3 regions, viz., the Districts of Muzaffarnagar, Ferozepore and Ahmednagar, under the Scheme of Farm Management Studies. In three of the remaining regions, Farm Management Studies were carried out during 1962-63 to 1964-65, and it may not be necessary to revise the weighting diagrams in these regions so soon. Steps may be taken for revising the weighting diagrams in the remaining 7 regions in 3 of which Farm Management Surveys were carried out during 1954-55 to 1956-57, in 3 during 1957-58 to 1959-60 and in 1 during 1960-61 to 1962-63. It may not be possible to revise the weighting diagrams in one 'shot' in all the regions and the work may have to be spread over a period of 5 to 6 years. It is recommended that while organising new Farm Management Studies due priority may be given to bring the weighting diagrams up-to-date. Till repeat surveys are undertaken, the existing weights have to be used.

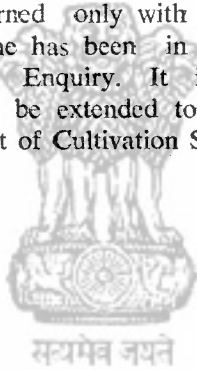
5.11. The interest on working capital is an important item of cost and interest payments should be taken into account in computing the Cost Index. Irrigation rates should also be considered. In the case of human labour, payment made to hired labour should be taken into account. The Committee feels that it would be enough to collect the data on wages once a month rather than every week as at present. In regard to bullock labour costs, the maintenance cost for bullock labour would be a better criterion than the charges for hiring bullock labour.

5.12. The Directorate of Economics and Statistics are also trying to construct Index Numbers of employment as well as Index Numbers of quantity marketed, stocks held, etc. The Committee on Index Numbers had expressed the view that "the measurement of employment bristled with a number of conceptual problems and it would, therefore, not be useful to construct any index number for the purpose of measuring changes in employment on the basis of limited data collected under this scheme". The Standing Technical Committee agrees with this view and feels that the index of employment need not be constructed. As regards information about quantity marketed, stocks, etc. it is suggested that this information may be collected once a month.

### **Index of Cost of Cultivation of Sugarcane**

5.13. The Scheme for working out the index of cost of cultivation of sugarcane in areas covered under the cost of cultivation survey was started by the erstwhile Indian Central Sugarcane Committee. The Scheme is now being operated by the Regional Office, Sugarcane Development with the technical guidance of the I.A.R.S. Out of six States, where the Survey of Cost of Cultivation was carried out, the Scheme is in operation in five States, *viz.*, Andhra Pradesh, Bihar, Mysore, Punjab and U.P. Information regarding wages and prices of inputs in sugarcane cultivation is reported monthly by Sugarcane Development personnel in the concerned States. The information is collected in the same samples of villages as were covered under the original enquiry on Cost of Cultivation of Sugarcane.

5.14. While the Indicator's Scheme, run by the Directorate of Economics and Statistics, aims at collecting information about the various aspects of farm economy, the Scheme pertaining to Index of Cost of Cultivation of Sugarcane is concerned only with the cost index of sugarcane cultivation. The latter Scheme has been in operation in five States covered under the original Enquiry. It is recommended that the coverage of the Scheme may be extended to all the 180 villages in the six States, covered by the Cost of Cultivation Survey.



## CHAPTER VI

### PROPOSALS

6.1. Although a number of studies to collect information in regard to the cost of cultivation of the principal crops have been undertaken in different parts of the country, they do not wholly meet the requirements of data for the formulation of price policy. The need for evolving a scheme for the collection of data on the cost of cultivation of principal crops, covering the entire country, so that there would be comparability and consistency between the data for the different years and the different regions, remains. Such a scheme could evolve only over time. An issue which needs to be considered is whether some short-term procedure could be followed meanwhile, in order that some data on cost of cultivation could be made available for the interim period. The Technical Committee has considered the question whether this could be done either by using the agency and the frame of the National Sample Survey (N.S.S.) or by extending the coverage of the Indicator's Schemes run by the Directorate of Economics and Statistics and the Regional Office, Sugarcane Development.

6.2. In the opinion of the Technical Committee, the frame of the N.S.S. would not be suitable for the purpose of collecting data on cost of cultivation. In the N.S.S., household is used as the sampling unit, whereas holding is to be regarded as a more appropriate sampling unit for the survey of cost. The N.S.S. follows the 'survey' method, whereas 'cost accounting method' has to be accepted as more suitable for the collection of data on cost.

6.3. The Technical Committee considered the question of expanding the coverage of the present Indicator's Schemes so that the data would become available at the earliest from a much larger number of villages. As mentioned above, the coverage of the present Schemes for constructing the indices of input costs is confined to a part of the sample villages covered under the original studies. It is recommended that the coverage of these Schemes be extended immediately to all the sample villages covered under the original Studies. This would involve extension of the coverage of the Indicator's Scheme from 52 villages to 190 villages. Careful attention needs to be given to the organisational arrangements needed for carrying out the Scheme with efficiency. If the entire work is to be handled directly by the Directorate of Economics and Statistics, it would raise problems of ensuring adequate supervision of field work. It may, therefore, be useful to enlist in this task the help of the existing Agro-Economic Research Centres and the Farm Management Centres too. To the extent it is feasible, basic work related to the Indicator's Scheme may be entrusted to these Centres. It is only where this cannot be arranged that the Directorate of Economics and Statistics may take the responsibility for



the collection of data. The suggestions of the Committee for making several modifications in the Indicator's Scheme have already been indicated in Chapter V.

6.4. Although a comprehensive survey of the cost of cultivation of cotton and the crops cultivated in rotation with it has been carried out by the ICAR, no Scheme for the construction of index numbers of cost in respect of cotton has been undertaken so far. It is recommended that using the data already collected under the I.C.A.R. Survey as the base, the construction of cost indices for cotton may also be taken up. The I.A.R.S. may prepare a suitable scheme for the purpose. A Study may also be carried out to ascertain the changes which may have become necessary in the weighting diagram. A sample of 10 villages in each region (*i.e.*, 40 villages in all) may be undertaken for the study and the 'cost accounting method' may be followed.

6.5. A number of issues need consideration in connection with the launching of a comprehensive and integrated programme for collecting information about the cost of cultivation of principal crops on all-India basis. Some of the issues involved relate to the form in which surveys should be carried out, their scope and coverage and the agencies which may be made responsible for them. Another basic question is whether it is necessary to launch an entirely new scheme in addition to the present scheme of Farm Management Studies, and whether the desired objectives cannot be achieved by expanding the coverage of the Farm Management Studies with suitable modifications.

6.6. Hitherto, the practice has been to undertake Cost of Cultivation Surveys and Farm Management Studies on an *ad hoc* basis. In each selected region, field work is carried out for a period of three years. After each Study has been completed, the staff employed is disbanded. Experience shows that this arrangement gives rise to problems of recruiting and retaining good and experienced persons. There are of course other basic questions. The Technical Committee is of the view that it would be desirable to organise the work of studying the cost of cultivation on a continuous basis. The Committee has considered two alternatives for implementing this suggestion. One alternative considered by the Committee is that the major crops and livestock products might be studied by rotation; the major crops being covered in the first two rounds, each involving three years of field work, and livestock products being covered in the third round, involving another two years of field work. This scheme would amount to carrying out detailed investigations for the principal crops every five years and those for livestock products every six years. A major disadvantage in this scheme would be that in the case of some of the principal crops, no data would be available for the first four or five years. The Committee, therefore, favoured the second alternative considered by it and recommends that a detailed

survey in respect of each crop may be carried out for a period of only one year (instead of three years envisaged in the first alternative), followed by survey of a sub-sample in the next five years. It would be possible in this manner to get detailed data on cost of production for a larger number of crops within a shorter period. The data collected from the same sub-samples over a number of years would provide adequate information to take care of seasonal fluctuations and would enable a precise study of yield variability bearing upon the risk and uncertainty confronting the farmer.

6.7. It would be possible under the above arrangement to undertake studies in regard to each major crop simultaneously in the different agro-climatic regions, enabling the collection of data on cost of production of a particular commodity grown under different rotational and cultural practices. In order that the studies may have full practical value, the aspect of shifting technologies as also that of evolving patterns of cropping and rotational practices should be kept in view. In regard to the farmer, the Committee would offer the following suggestions :

- (a) Many farmers would be found to be using modern inputs on only a part of their holdings. In such cases, the input, output and cost data for the two parts of a holding—that on which modern technology is employed and the other on which it is not—should be separately recorded;
- (b) The technological improvements in the 'barani' tracts would importantly take the form of introduction of tractors and pump-sets. Wherever they are introduced, their impact on cost should be specifically studied; and
- (c) Steps should be taken to ensure that the IADP data which are designed to show the impact of improved technology are collected on the same basis as those obtaining in the case of the comprehensive and integrated scheme for the collection of cost data.

6.8. For fixing agricultural prices one needs, in addition to the data on cost of production, information which may be of help in forming an idea of what might be deemed to be a 'fair return' on farm investments. It would, therefore, be very useful if information on earnings through alternative modes of investment, typified say, by the typical rates of interest prevalent in the different regions, is collected alongside the cost data.

6.9. Taking into account the cost of the Scheme and the need for getting data for as many crops as possible, the Committee feels that it is not necessary from the beginning, to carry out surveys of the same crops in all the States at the same time, but it would be adequate if the important crop zones are covered. For example, the survey relating to rice may not be carried out simultaneously in all the States, but may be conducted in three

or four important zones in the country, while the survey staff in those States, where the survey on the cost of production of paddy is not being carried out, could be used for studying the other principal crops.

6.10. The question of the agency, or agencies, which may be entrusted with the carrying out of Cost Studies has to be examined. A view has to be taken whether the field work in the different States and Regions should be entrusted to a Central agency, or to the State Governments, or to the non-official agencies like the Agricultural Universities and the Agro-Economic Research Centres. The balance of advantage appears to lie in entrusting the work, as far as possible, to the Agricultural Universities and the Agro-Economic Research Centres inasmuch as this would provide continuity with the work already initiated. Such arrangement would also result in the association of scientific and non-official research organisations in developing crucial data, which could, therefore, be considered un-biased by the general public. Where it is not possible to utilise the services of the non-official agencies, the State Governments may carry out the field work till such time as alternative arrangements can be made.

6.11. A Central Committee of Direction may be set up to provide overall technical guidance and to ensure general comparability between the results of the studies carried out by the different organisations in the different parts of the country. The Committee may consist of representatives of the Agricultural Prices Commission, Directorate of Economics and Statistics, I.A.R.S., Agricultural Universities, Agro-Economic Research Centres, and a few Experts. A Secretariat may be established in one of the existing organisations, such as the I.A.R.S. or the Directorate of Economics and Statistics, for providing assistance to the Committee of Direction in its work and for carrying out the necessary coordination, processing and analysis of data.

6.12. A comprehensive Scheme for studying the cost of cultivation of principal crops in India has been prepared by the I.A.R.S. (Appendix IV). The Scheme envisages the carrying out of cost of cultivation studies in all the States in the country on a continuous basis along the lines suggested in para. 6.6 above. Steps should be taken to launch the Scheme from the 1968-69 kharif season.

6.13. The attention of the Committee has been drawn also to certain *ad hoc* proposals for assessing the cost of production of certain special crops in selected regions in the country. It is suggested that in the case of crops (e.g. plantation crops) that are important from the point of view of export and which cannot be covered immediately under the comprehensive scheme prepared by the I.A.R.S., special enquiries, on an *ad hoc* basis, may be undertaken, as and when necessary.

## CHAPTER VII

### SUMMARY OF MAIN CONCLUSIONS AND RECOMMENDATIONS

7.1. Although a number of Studies to collect information about cost of cultivation of principal crops have been carried out in different parts of the country, they do not altogether meet the requirements of data for the formulation of price policy. There is need to evolve a scheme for the collection of data on cost of cultivation of principal crops covering different regions so that there would be comparability and consistency between the data for the different areas and the different regions.

7.2. As an interim measure, the coverage of the existing schemes for constructing indices of input costs, viz., the Indicator's Scheme, operated by the Directorate of Economics and Statistics, and the Scheme for Index Numbers of Cost of Cultivation of Sugarcane, organised by the Regional Office, Sugarcane Development, should be extended to all the sample villages covered under the original Farm Management Studies and the Survey of Cost of Cultivation of Sugarcane.

7.3. To the extent it is possible, basic task relating to the Indicator's Scheme may be entrusted to the Agro-Economic Research Centres and the Farm Management Centres. Where this cannot be done, the Directorate of Economics and Statistics may take the responsibility for the collection of data.

7.4. In addition to the indices already being constructed under the Indicator's Scheme, index numbers of prices of material inputs, prices received by the farmers for agricultural commodities and prices paid by the farmers for industrial consumers' goods may also be constructed.

7.5. For purposes of the Indicator's Scheme, it may be necessary to bring the weighting diagrams up-to-date in areas where considerable time has elapsed since the Farm Management Studies were initially undertaken. Due priority may be given to repeat survey in such areas to bring the weighting diagrams up-to-date.

7.6. As regards the weights to be used in the construction of index numbers of prices paid by the farmers for industrial consumer goods, the available N.S.S. data may be looked into and, if necessary, a quick bench-mark survey may be carried out in selected areas. Whatever procedure is followed, it should be adopted uniformly in all the selected areas.

7.7. Under the Indicator's Scheme, the same farmers need not be approached year after year, but a fresh sample of cultivators may be selected.

7.8. The Directorate of Economics and Statistics may carry out a detailed examination of the procedure followed and the weights used by it for the construction of the various index numbers. Interest on working capital and irrigation rates should be taken into account in computing the index of cost of cultivation. In the case of human labour, payment made to hired labour should be considered. For constructing the index of the cost of bullock labour, maintenance cost would be a better basis of assessment than hire charges.

7.9. In addition to the scheme for constructing the Index of Cost of Cultivation of Sugarcane, a scheme for constructing the index of cost in respect of cotton, on the basis of data collected under the survey relating to the cost of cultivation of cotton conducted by the ICAR, may be prepared by the I.A.R.S. and put into operation. A study may also be carried out to ascertain the changes, which may have become necessary, in the weighting diagram. A sample of 10 villages in each region (*i.e.*, 40 villages in all) may be undertaken for the study and the 'cost accounting' method may be followed.

7.10. A comprehensive scheme should be introduced for studying the cost of cultivation of the principal crops on all-India basis. A suitable procedure would be to take up studies of different crops by rotation so that while the crops and the samples would be changing from year to year, the same survey staff would be retained.

7.11. A detailed survey may be carried out in respect of each principal crop for a period of one year, followed by survey of a sub-sample in the next five years.

7.12. In order that the Studies may have full practical value, the aspect of shifting technology as also that of the evolving pattern of cropping and rotational practices should be kept in view.

7.13. It is not necessary that, from the very beginning, surveys of the same crop should be carried out in all the States at the same time, but it would be adequate if various important crop zones are covered.

7.14. The work under the Scheme for studying the Cost of Cultivation of Principal Crops in different States may be entrusted, as far as possible, to non-official agencies such as the Agricultural Universities and the Agro-Economic Research Centres in the various States. Where it is not possible to entrust the work to these agencies, the State Governments may carry out the field work till alternative arrangements are made.

7.15. A Central Committee of Direction may be set up to provide over-all technical guidance and to ensure proper coordination. The Committee may

consist of representatives of the Agricultural Prices Commission, the Directorate of Economics and Statistics, the I.A.R.S., the Agricultural Universities, the Agro-Economic Research Centres, and a few Experts. A Secretariat may be established in one of the existing organisations, such as the I.A.R.S. or the Directorate of Economics and Statistics, for providing assistance to the Committee of Direction in its work and for carrying out necessary coordination, processing and analysis of data.

7.16. In order that comparable data on cost of various crops and regions in the country might be available in future, all the basic concepts and definitions to be used in the Surveys should be decided upon before the actual commencement of the field work. A number of observations on issues relevant in this connection have been included in Chapters IV and VI.

7.17. The Scheme for studying the Cost of Cultivation of the Principal Crops in the country may be put into operation from the kharif of 1968-69. Necessary action for the processing of the Scheme and making arrangements for its implementation should be taken up on priority basis.

7.18. Steps should be taken to ensure that the I.A.D.P. data, which are designed to show the impact of improved technology, are collected on the same basis as those obtaining in the case of the comprehensive and integrated Scheme for the collection of cost data.

7.19. In regard to such crops (e.g., plantation crops) as are considered important from the point of view of export, and which would not be covered under the comprehensive scheme, special enquiries, on an *ad hoc* basis, may be undertaken, as and when necessary in selected areas.

सत्यमेव जयते

## APPENDIX I

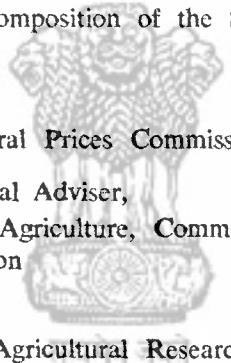
### GOVERNMENT OF INDIA MINISTRY OF FOOD, AGRICULTURE, COMMUNITY DEVELOPMENT AND COOPERATION (DEPARTMENT OF AGRICULTURE)

*New Delhi, dated the 8th February, 1967*

#### Resolution

The Government of India have had under consideration the question of setting up a technical committee to advise on the technical aspects of the scheme for collection of data on cost of production of sugarcane and other crops and for building up index of input costs. They have now decided to set up a Standing Technical Committee to provide necessary guidance in organising the collection of data on indices of input costs and also in organising cost of production surveys on an integrated basis.

2. **Composition.**—The composition of the Standing Technical Committee shall be as follows :

- 
1. Dr. Ashok Mitra,  
Chairman, Agricultural Prices Commission *Chairman*
  2. Economic & Statistical Adviser,  
Ministry of Food, Agriculture, Community Development and Cooperation *Member*
  3. Statistical Adviser,  
Indian Council of Agricultural Research *Member*
  4. Dr. A. B. Joshi,  
Deputy Director General,  
Indian Council of Agricultural Research *Member*
  5. Dr. S. Chakravarty,  
Prof. of Mathematical Economics,  
Department of Economics,  
Delhi University *Member*
  6. Dr. A. S. Cheema,  
Agricultural Production Commissioner,  
Ministry of Food, Agriculture, Community Development and Cooperation *Member*

7. Dr. K. Kanungo,

Head of the Division of Agricultural Economics,  
Indian Agricultural Research Institute

*Member*

8. Shri R. N. Kaushik,

Additional Economic and Statistical Adviser,  
Directorate of Economics & Statistics

*Convenor*

3. **Terms of reference.**—The terms of reference of the Standing Technical Committee shall be—

1. To advise on issues connected with the formulation of indices of input costs for sugarcane and other agricultural commodities, likely to be useful in forming judgements on questions of price policy;
2. To examine the available data on cost of production of sugarcane and other agricultural commodities, collected through Farm Management Studies and other surveys, and to make suggestions for bringing, whenever necessary, the available data up-to-date on the basis of *ad hoc* judgements and through quick additional surveys;
3. To advise on the scope and design of future surveys of cost of production, proposed to be organised on a coordinated basis in different parts of the country, with due regard to the requirements of constructing the indices of input costs;
4. To advise on any other matters relating to collection and utilization of data on cost of production of agricultural commodities, as may be referred to it by the Ministry of Food, Agriculture, Community Development and Cooperation.

4. The Committee shall meet from time to time and advise on matters referred to them.

[No. 7-1/67-Econ. Py.]

B. SIVARAMAN,  
*Secretary to the Government of India*



## APPENDIX II

### *Cost Studies undertaken by Various Agencies in Different Regions*

Crop/State	Period	Sponsoring agency	No. of dist- riets covered	No. of sample villages	No. of hold- ings
<i>Paddy</i>					
Andhra Pradesh	1957-58 to 1959-60	Directorate of E. & S.	1	10	100
	1961-62 to 1963-64	Govt. of Andhra Pradesh	3	60	540
Assam	1963-64 to 1965-66	I.C.J.C.	4	35	8-10 in each village
	1963	Govt. of Assam	4	..	1,360
Bihar	1957-58 to 1959-60	Directorate of E. & S.	1	10	100
	1960-61 to 1962-63	Directorate of E. & S.	1	10	150
	1963-64 to 1965-66	I.C.J.C.	3	35	8-10 in each village
	1962-63	Govt. of Bihar	Important agri- cultural regions	6	108
Gujarat	1966-67 to 1968-69	Directorate of E. & S.	1	15	150
Kerala	1962-63 to 1964-65	Do.	2	10	100
Madhya Pradesh	1962-63 to 1964-65	Do.	1	10	100
Madras	1954-55 to 1956-57	Do.	2	20	200
	1966-67 to 1968-69	Do.	1	15	150
	1962-63 to 1963-64	Govt. of Madras	2	..	..
Mysore	1959-60 to 1961-62	Directorate of E. & S.	1	10	100
	1963-64 to 1965-66	Government of Mysore	2	20	200
Orissa	1957-58 to 1959-60	Do.	1	10	100
Punjab	1951-52 to 1955-56	Board of Economic Enquiry, Punjab.	12	21	..

APPENDIX II—*contd.*

Crop/State	Period	Sponsoring agency	No. of dist- riets covered	No. of sample villages	No. of hold- ings
<i>Paddy—contd.</i>					
Uttar Pradesh	1954-55 to 1956-57	Directorate of E. & S.	2	20	200
	1964-65	Government of U.P.	2	..	320
West Bengal	1954-55 to 1956-57	Directorate of E. & S.	2*	20	200
	1962-63 to 1963-64	Govt. of West Bngal	5	15	120
	1963-64 to 1965-66	I.C.J.C.	10	50	8-10 in each village
<i>Wheat</i>					
Bihar	1957-58 to 1959-60	Directorate of E. & S.	1	10	100*
	1960-61 to 1962-63	Do.	1	10	150*
	1962-63	Govt. of Bihar	Impor- tant agri- cultural regions	6	108
Maharashtra	1954-55 to 1956-57	Directorate of E. & S.		2	16
	1955-56 to 1956-57	Do.		2	20
	1966-67 to 1968-69	Do.		1	..
Punjab	1954-55 to 1956-57	Do.	2**	20	200
	1961-62 to 1963-64	Govt. of Punjab	3	20	200
	1960-61 to 1962-63	I.C.O.C. & I.C.C.C.	4	40	300
	1951-52 to 1955-56	Board of Economic Enquiry, Punjab.	12	21	—
Rajasthan	1962-63 to 1964-65	Directorate of E. & S.	1	10	100
Uttar Pradesh@	1954-55 to 1956-57	Do.	2	20	200
	1966-67 to 1968-69	Do.	2	15	150
	1964-65	Govt. of U.P.	2	..	—

\*—Covered also under the Govt. of West Bengal and I.C.J.C. Studies.

\*\*—Covered also under the Board of Economic Enquiry Studies.

@—One district is common in the two Studies of Directorate of E. &amp; S.

## APPENDIX II—contd.

Crop/State	Period	Sponsoring agency	No. of districts covered	No. of sample villages	No. of holdings
<i>Wheat</i> —contd.					
West Bengal	1962-63 to 1963-64	Govt. of W. Bengal	5	15	120
<i>Jowar</i>					
Andhra Pradesh	1961-62 to 1962-63	Govt. of A. Pradesh	3	60	540
Gujarat	1960-61 to 1962-63	I.C.O.C. & I.C.C.C.	7	40	300
Madras	1954-55 to 1956-57	Directorate of E. & S.	2	20	200
Maharashtra@	1954-55 to 1956-57	Do.	1	8	80
	1966-67 to 1968-69	Do.	1	..	..
	1960-61 to 1962-63	I.C.O.C. & I.C.C.C.	6	40	200
Mysore	1960-61 to 1962-63	Do.	3	40	300
Punjab	1961-62 to 1963-64	Govt. of Punjab	3	20	200
Rajasthan	1962-63 to 1964-65	Do.	1	10	100
<i>Bajra</i>					
Madras	1954-55 to 1956-57	Do.	2	20	200
Maharashtra@	1954-55 to 1956-57	Do.	2	16	160
	1966-67 to 1968-69	Do.	1	..	..
Punjab	1961-62 to 1963-64	Do.	3	20	200
Rajasthan	1962-63 to 1964-65	Do.	1	10	100
<i>Maize</i>					
Bihar	1957-58 to 1959-60	Do.	1	10	100
	1962-63	Govt. of Bihar	Important agri-cultural regions	6	108
Uttar Pradesh	1954-55 to 1956-57	Directorate of E. & S.	2	20	200
Punjab	1951-52 to 1955-56	Board of Economic Enquiry, Punjab.	12	21	...
<i>Ragi</i>					
Andhra Pradesh	1961-62 to 1963-64	Govt. of Andra Pradesh	3	60	540

@—One district is common in the two Studies of the Directorate of E. & S.

## APPENDIX II—contd.

Crop/State	Period	Sponsoring agency	No. of districts covered	No. of sample villages	No. of holdings
<i>Ragi—contd.</i>					
Madras . . .	1954-55 to 1956-57	Directorate of E. & S.	2	20	200
Mysore . . .	1959-60 to 1961-62	Do.	1	10	100
	1962-63 to 1964-65	Do.	1	20	240
<i>Barley</i>					
Uttar Pradesh . .	1964-65	Govt. of U.P.	2	..	320
<i>Gram</i>					
Bihar . . . . .	1962-63	Govt. of Bihar	Important agri-cultural regions	6	108
Maharashtra* . .	1954-55 to 1956-57	Directorate of E. & S.		2	16
	1966-67 to 1968-69	Do.		1	..
Punjab . . . . .	1961-62 to 1963-64	Govt. of Punjab		3	20
	1951-52 to 1955-56	Board of Economic Enquiry, Punjab.	12	21	..
Uttar Pradesh . .	1954-55 to 1956-57	Directorate of E. & S.	2	20	200
	1964-65	Govt. of U.P.	2		320
<i>Wheat and Gram</i>					
Bihar . . . . .	1957-58 to 1959-60	Directorate of E. & S.	1	10	100
	1960-61 to 1962-63	Do.	1	10	150
Punjab . . . . .	1951-52 to 1955-56	Board of Economic Enquiry, Punjab.	12	21	..
	1954-55 to 1956-57	Directorate of E. & S.	2@	20	200
<i>Sugarcane</i>					
Andhra Pradesh†	1955-56 to 1957-58	I.C.S.C.	5	15	180
	1961-62 to 1963-64	Govt. of Andhra Pradesh	3	60	540
Bihar (North) . .	1955-56 to 1957-58	I.C.S.C.	4	30	360
Bihar (South) . .	1955-56 to 1957-58	Do.	3	15	180
Maharashtra . .	1956-57 to 1958-59	Do.	5	15	180

\*—One district is common in two Studies of Directorate of E. & S.

@—Covered also under the Board of Economic Enquiry Studies.

†—One district is common in Studies of the I.C.S.C. and Govt. of Andhra Pradesh.

## APPENDIX II—contd.

Crop/State	Period	Sponsoring agency	No. of districts covered	No. of sample villages	No. of holdings
<i>Sugarcane—contd.</i>					
Mysore	1963-64 to 1965-66	Govt. of Mysore	1	20	200
	1960-61 to 1962-63	I.C.S.C.	5	15	180
Orissa	1957-58 to 1959-60	Directorate of E. & S.	1	10	100
Punjab*	1961-62 to 1963-64	Govt. of Punjab	3	20	200
	1955-56 to 1957-58	I.C.S.C.	3	12	144
	1951-52 to 1955-56	Board of Eco. Enquiry, Punjab.	12	21	..
U.P.‡(Western)	1955-56 to 1957-58	I.C.S.C.	11	30	360
(Central)	1955-56 to 1957-58	Do.	7	15	180
(Eastern)	1955-56 to 1957-58	Do.	5	30	360
	1954-55 to 1956-57	Directorate of E. & S.	2@	20	200
	1966-67 to 1968-69	Do.	2	..	..
	1964-65	Govt. of U.P.	2	..	320
West Bengal	1962-63 to 1963-64	Govt. of West Bengal	5	15	120
<i>Cotton</i>					
Gujarat	1960-61 to 1962-63	I.C.O.C. & I.C.C.C.	7	40	300
Madras	1954-55 to 1956-57	Directorate of E. & S.	2	20	200
Maharashtra	1960-61 to 1962-63	I.C.O.C. & I.C.C.C.	6	40	200
Mysore	1960-61 to 1962-63	I.C.O.C. & I.C.C.C.	3	40	300
Punjab‡	1954-55 to 1956-57	Directorate of E. & S.	2	20	200
	1960-61 to 1962-63	I.C.O.C. & I.C.C.C.	4	40	300
	1951-52 to 1955-56	Board of Economic Enquiry, Punjab.	12	21	..

\*—Two districts are common in the Govt. of Punjab and the Board of Economic Enquiry, Punjab Studies.

@—One district is common in both the Studies of Directorate of E. & S.

‡—Three districts are common in the Studies of the I.C.S.C. Study and the Directorate of E. & S. Studies.

‡—Two districts are common in the Studies of the Board of Economic Enquiry, Punjab and Directorate of E. & S. Studies.

APPENDIX II—*contd.*

Crop/State	Period	Sponsoring agency	No. of districts covered	No. of sample villages	No. of holdings
<i>Cotton—contd.</i>					
Uttar Pradesh	1954-55 to 1956-57	Directorate of E. & S.	2	20	200
<i>Groundnut</i>					
Andhra Pradesh	1961-62 to 1963-64	Govt. of Andhra Pradesh	3	60	540
Gujarat	1960-61 to 1962-63	I.C.O.C. & I.C.C.C.	7	38	300
Madras	1954-55 to 1956-57	Directorate of E. & S.	2	20	200
Maharashtra	1960-61 to 1962-63	I.C.O.C. & I.C.C.C.	6	40	200
Mysore	1960-61 to 1962-63	Do.	3	40	300
Orissa	1957-58 to 1959-60	Directorate of E. & S.	1	10	100
Punjab	1960-61 to 1962-63	I.C.O.C. & I.C.C.C.	4	40	300
<i>Jute</i>					
Assam*	1963-64 to 1965-66	I.C.J.C.	4	35	8-10 holdings in each village
	1963	Govt. of Assam	4	..	1360
Bihar	1963	I.C.J.C.	3	35	1360
West Bengal**	1963	Do.	10	50	1360
	1954-55 to 1956-57	Directorate of E. & S.	2	20	200
	1962-63 to 1963-64	Govt. of W. Bengal	5	15	120
<i>Tobacco</i>					
Andhra Pradesh	1957-58 to 1959-60	Directorate of E. & S.	1	10	100
<i>Pulses</i>					
West Bengal	1954-55 to 1956-57	Do.	2	20	200
Orissa	1957-58 to 1959-60	Do.	1	10	100
<i>Chillies</i>					
Bihar	1957-58 to 1959-60	Do.	1	10	100

\*—The four districts are common between the two Studies of the ICJC and the Government of Assam.

\*\*—Two districts are common between the Studies of the Directorate of E. & S., I.C.J.C. and the Government of West Bengal.

सत्यमेव जयते

Directorate of Eco  
Sugarcane Commit  
Jute Committee  
Oilseeds Committee  
Cotton Committee

## APPENDIX III

### *Concepts of Costs of Cultivation used in some Studies conducted in the Past*

#### *I. Farm Management Studies sponsored by the Directorate of Economics and Statistics*

1. The following four concepts of costs have been used in the Farm Management Studies sponsored by the Directorate of Economics and Statistics in selected districts in the country :

Cost A <sub>1</sub> . . . . .	Cash & Kind expenses (or paid out costs) actually incurred by owner operator. This includes cash and kind expenditure on items like hired human labour, bullock labour, seed, manure, fertilizers, land revenue and cess, irrigation charges, depreciation charges of implements, machinery and buildings and interest on crop loans.
Cost A <sub>2</sub> . . . . .	Cost A <sub>1</sub> + rent paid for leased-in land.
Cost B . . . . .	Cost A <sub>2</sub> + rental value of owned land and interest on owned fixed capital excluding land.
Cost C . . . . .	Cost B + imputed value of family labour.

2. The estimates of cost relate to the selected districts covered under the Farm Management Studies.

#### *II. Studies of Cost of Cultivation of Cotton, Oilseeds, Sugarcane, etc. sponsored by the Commodity Committees of I.C.A.R.*

3. The concepts used in the Studies sponsored by the Commodity Committees in different States are as follows :

Cost A . . . . .	Includes actual expenses in cash and kind incurred on production (or paid out costs).
Cost A <sub>1</sub> . . . . .	Cost A + rent paid for leased-in land.
Cost A <sub>2</sub> . . . . .	Cost A + imputed value of farmer's own and his family's labour.
Cost B . . . . .	Cost A + imputed rent on owned land + interest on owned capital.
Cost C . . . . .	Cost B + imputed value of the farmer's and his family's labour (In the case of Studies relating to Sugarcane, managerial allowance for the operator is also included in Cost C).

4. The estimates of cost relate to the States covered under the Studies.



APPENDIX III—*contd.*III. *Studies of Board of Economic Enquiry Punjab* (Now Economic & Statistical Organisation)

5. The following concepts have been used in the "Surveys in Farm Accounts" :

Basis A	. . . . .	Actual expenditure+rent paid for leased-in land+rental value of owned land+interest on fixed capital+imputed value of the farmer's own and his family's labour.
Basis B	. . . . .	Actual expenditure+rent paid for leased-in land+interest on fixed capital.
Basis C	. . . . .	Actual expenditure+interest on capital.
Basis D	. . . . .	Actual expenditure.

6. The surveys on Farm Accounts give data for Farm Business as a whole and not for individual crops. The Board of Economic Enquiry has also published a report on *Cost of Production of Crops in Punjab 1951—56* (Publication No. 77) in which data on Basis 'A' only have been given.

IV. *Study on Farm Management and Cost of Production carried out by the Government of West Bengal.*

7. The cost includes human labour (family & hired separately), bullock labour, implements, irrigation charges, rent, rent in kind, miscellaneous, interest on capital, seeds, market charges, fertilizers and management allowance.

V. *Study on Cost of Production of some Important Crops carried out by Government of Andhra Pradesh.*

Cost A <sub>1</sub>	. . . . .	(1) Cost of Manures and Fertilizers, (2) Cost of Seeds, (3) Cost of other materials, (4) Charges for hired human labour, (5) Charges for both owned and hired bullock labour, (6) Hire charges of implements, (7) Land Revenue, and (8) Other Miscellaneous charges.
Cost A <sub>2</sub>	. . . . .	Cost A <sub>1</sub> +rent paid for leased-in land.
Cost B	. . . . .	Cost A <sub>2</sub> +rental value of owned land operated by the cultivator+ interest on fixed capital (excluding land).
Cost C	. . . . .	Cost B+imputed value of family labour.
Prime Cost	. . . . .	Cost A <sub>1</sub> +imputed value of family labour.

VI. *Study of Indebtedness among the Cultivators in the Jute Growing Areas of Assam by the Government of Assam.*

The cost includes cost of human labour, bullock labour, manure, seed, implements and rent.

## APPENDIX IV

### *Scheme for the Study of Cost of Cultivation of Principal Crops in India\**

1. The cost of production of agricultural commodities has been a subject of interest to economic research workers and policy makers since long time. An extensive survey for the study of cost of production of principal crops in cotton and sugarcane regions was carried out by the I.C.A.R. as early as 1934—37. The demand for farm cost data has been on the increase since Independence and considerable progress has been made in the methodology of the surveys in the post-Independence years. An important landmark in the methodological progress was the holding of a Seminar at Matheran in 1960 under the joint auspices of the Indian Society of Agricultural Economics and the Indian Society of Agricultural Statistics, to discuss problems of cost studies in agriculture. At this Seminar, the uses of cost data for micro and macro-economic purposes were also discussed. The Standing Technical Committee on Indices of Input Costs also examined various aspects of cost of cultivation data in relation to price policies and came to the conclusion that to secure cost of cultivation data useful for price policy it was necessary to make permanent arrangements for collection of such data on a continuous and uniform basis for all important crops in the country. Accordingly, the present scheme has been drawn up by the Institute of Agricultural Research Statistics in keeping with the guide lines provided by the Committee.

#### *Objective and Coverage*

2. The objective of the present scheme is thus to set up a permanent machinery for the collection of cost of cultivation data for all important crops in all parts of the country on a continuous basis. In view of the need for economy, the various important crops in different regions will be covered in a phased programme. The study of different crops will be taken up by rotation so that while the crops and the samples would be changing from time to time, the same staff would continue. It is proposed to carry out a detailed survey in respect of each principal crop for a period of one year to be followed by surveys of a sub-sample in the next five years. The exact period of detailed survey during the first year may vary slightly from area to area according to agricultural practices followed to fully cover the resources spent in preparatory work. Although it would be necessary in due course to build up State-wise estimates of cost of cultivation of principal crops, it may not be necessary from the very beginning to undertake surveys of the same crops in all the areas at the same time and it may be enough if various important crop zones are covered. This arrangement

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\*Scheme prepared by the I. A. R. S.

would make it possible to collect data for a larger number of crops with given staff in a short period. In order that the surveys may have full practical value, the aspect of shifting technology would be kept in view, as also the evolving patterns of cropping and rotational practices.

3. The scheme aims at collection of representative data on inputs and output in physical as well as monetary terms. This will provide not only the estimates of average cost for various categories of holdings according to various cost concepts for principal crops in all areas, but also provide information on the distribution of holdings, area and production according to level of cost.

4. The country is broadly divisible into three crop zones, namely, rice zone, wheat zone and millet zone. Principally to indicate the distribution effort in the three zones, three schemes have been drawn up separately, one for each zone, as parts of the coordinated scheme. The crop zones cut across State boundaries. For the purpose of administrative convenience, however, each State has to be included in one of the three zones, though data on all important crops will be collected in each State regardless of the zone to which it belongs. The analysis of data and the coordination of field work has to be the responsibility of a statistical agency. This work has been shown as another project and the financial implications have been worked out separately for it; this also constitutes a part of the coordinated scheme. The details of phasing of crops have been given in the individual schemes.

#### *Method of Study and Design of Survey*

5. Cost accounting method will be adopted for the study which means that the data on inputs and output will be collected by wholtime fieldmen residing in the villages selected for enquiry on the basis of day-to-day observations and contact with selected cultivators as various agricultural operations take place. The work of the fieldmen will be supervised by field supervisors and a field officer in each State, who will undertake frequent tours to the selected villages for this purpose as well as for providing on-the-spot guidance to the fieldmen. The survey unit in each State will thus consist of a field officer under whom there will be a number of field supervisors and fieldmen and a few statistical workers for scrutiny and preliminary tabulation of data. The data will be recorded by the fieldmen in prescribed forms and sent to the respective statistical units according to a time schedule. The statistical units will scrutinise and tabulate the data in preliminary forms and send it to the I.A.R.S. for further processing. The data will be processed at this Institute with the help of electronic computer and the results will be presented in the form of reports. A special officer will be appointed at the Institute to hold charge of the scheme. He will participate in supervision of field work, coordinate the work in different States and prepare the reports. The scheme will be under the immediate supervision of the Statistical Adviser, I.C.A.R. but a Committee of Direc-

tion consisting of experts might be set up to provide overall technical guidance and to ensure general comparability between results of studies carried out in different States.

6. The design of the study will be three-stage stratified random sampling design with tehsil as the primary sampling unit, a cluster of 3 villages as the secondary unit and an operational holding within a cluster as the third and ultimate stage sampling unit. States which are heterogeneous in respect of the cropping pattern will be divided into principal crop zones and one zone will be covered each year. Each such zone will be stratified into groups of districts on the basis of contiguity and homogeneity of agricultural conditions and cultivation practices. In each such stratum a certain allocated number of tehsils will be selected with probability proportional to the area under the principal crops aimed at. In each selected tehsil, a cluster of three villages will be selected as the second State unit with varying probabilities as in the selection of tehsils. Usually 30 to 40 such clusters will be selected in each region. In each cluster, a list of operational holdings will be prepared initially and holdings will be selected randomly from this list after stratifying the holdings according to size into 4 or 5 size classes. Usually two holdings will be selected in each size class. In addition, two holdings growing improved/high-yielding varieties of crops or representing the class of progressive cultivators according to some standard may also be selected in each cluster to be able to cover newly developing technologies, cropping patterns, etc. Data on inputs and output will be collected by the fieldmen for this set of selected holdings by the cost accounting method as mentioned earlier.

#### *Concepts of Cost*

7. One of the objects of taking up this comprehensive scheme is to ensure collection of cost data in various regions according to uniform cost concepts. Experience has shown that broadly three cost concepts are useful for policy purposes, namely, the paid-out costs (cost A), these with the addition of imputed interest on owned capital and rent of owned land (cost B), and this plus the imputed value of holdings' own labour (cost C). The costs will be estimated according to all the three concepts. The procedures of evaluation and allocation will also be laid down on a uniform basis. The average costs according to various classes of holdings will be worked out as well as the bulk-line costs. In framing the estimates of cost, no allowance may be made for managerial function.

#### *Precision of Estimates*

8. In the light of experience of earlier surveys the scale of sampling proposed is such as to give estimates of reasonable precision, 5% or smaller standard errors for principal crops at the State level. For relatively smaller States, such as Haryana, Kerala, etc., the sampling is on a smaller scale in

the interest of economy. However, such States are likely to be somewhat more homogeneous than larger States in respect of agricultural conditions and we might expect the State level estimates for these States to be useful though of slightly reduced precision, at least for the principal crops. For minor crops which may not be cultivated by many of the sample holdings with consequent reduction in available data, the precision of estimates will be lower. For such crops as well as for estimates of cost for specified classes of holdings, standard errors of the order of 6 to 8 per cent are expected. This holds true for varieties of crops also, *i.e.*, for principal varieties cultivated extensively in a State also, estimates of such precision are expected to be obtained.

### *Organisation and Staff Requirements*

9. Village level fieldmen constitute the backbone of the enquiry. They will have to be provided in each State at the rate of one for each cluster of villages proposed to be selected with 10% extra as leave reserve. The number of units proposed to be selected in different States and the field and statistical staff required are indicated in the individual schemes. The fieldmen should be matriculates with Diploma in Agriculture. Field supervisors will be provided at the rate of one for every 10 fieldmen. These should normally be graduates in agriculture with some experience of field investigation. The field officers in various States should be graduates in agriculture with at least 3 years' experience of research work. The units should be located in Agricultural Universities or Agro-Economic Research Centres as far as possible. Association of such scientific and unofficial bodies will help to provide technically sound data which will also be considered free from any official bias. However, where such an arrangement will not be possible the units will have to be located in State Departments of Agriculture or Statistics.

10. The entire staff of the cost study units will have to be recruited directly and placed on a permanent footing after the probationary period. Incentive in the form of advance increments may be given to attract experienced workers.

### *Financial Implications*

11. The schemes for studying the cost of cultivation of principal crops in the rice, wheat and millet regions are given in Annexures I, II and III. These include details regarding States constituting the zones, crops covered and their phasing, the sample size, staff requirements and financial implications. The last can be worked out accurately only after the location of various units in the respective States is finalised, and details regarding prevailing scales of pay and allowances become available. However, to get a rough idea of the cost involved, tentative estimates of cost have been worked out on the basis of reasonable assumptions regarding scales of pay,

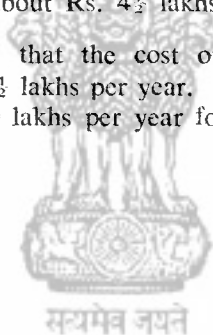
etc. The staff requirements and cost estimates for the cost study unit at the I.A.R.S. have similarly been worked out and given in Annexure IV.

12. It will be seen from Annexure I that the scheme in rice region covers the States of Assam, West Bengal, Orissa, Bihar, Andhra Pradesh, Madras and Kerala. It covers principally the crops rice, millets, cotton, jute, sugarcane, groundnut and potato in important producing States. The cost is estimated at Rs. 7 lakhs per year approximately.

13. From Annexure II it is seen that the scheme in the wheat region covers the States of U.P., Punjab, Haryana, Himachal Pradesh, Jammu & Kashmir and Madhya Pradesh. It covers principally the crops wheat, millets, rice, cotton, sugarcane, groundnut and potato and costs Rs. 4½ lakhs per year approximately.

14. From Annexure III it is seen that the scheme in the millet zone covers the States of Rajasthan, Gujarat, Maharashtra and Mysore and the crops are millets, wheat, rice, cotton, groundnut, sugarcane and tobacco principally. It would cost about Rs. 4½ lakhs per year.

15. Annexure IV shows that the cost of the statistical unit at the I.A.R.S. will be about Rs. 3½ lakhs per year. The total cost of the scheme would thus be about Rs. 20 lakhs per year for the country as a whole



## ANNEXURE I

### *A Scheme to study Cost of Cultivation of Crops in the Rice Region*

1. Rice is the most important cereal crop of the country and is grown in almost all the States. However, the States of Assam, Bihar West Bengal, Orissa, Andhra Pradesh, Madras and Kerala might be considered the most important rice-producing States. Other important crops of these States are jute in West Bengal, Assam, Bihar and Orissa, sugarcane in Bihar, Andhra Pradesh and Madras, cotton and oilseeds in Andhra Pradesh and Madras. The following are the important crops which are proposed to be covered :

State	Crops covered
Assam . . . . .	Rice, Jute, Fruits.
Bihar . . . . .	Jute, Rice, Sugarcane, Wheat, Maize.
West Bengal . . . . .	Jute, Rice, Potato, Pulses.
Orissa . . . . .	Jute, Rice, Oilseeds, Pulses.
Andhra Pradesh . . . . .	Sugarcane, Rice, Tobacco, Castor, Cotton, Jowar, Groundnut.
Madras . . . . .	Sugarcane, Rice, Cotton, Jowar, Bajra, Groundnut.
Kerala . . . . .	Rice, Plantation crops, Spices crops.

2. The number of primary sampling units to be selected in each State and the field and statistical staff required will be as follows :

State	No. of primary sampling units	Number of Fieldmen	Field supervisors	Computers
Assam . . . . .	30	33	3	3
Bihar . . . . .	40	44	4	4
West Bengal . . . . .	40	44	4	4
Orissa . . . . .	30	33	3	3
Andhra Pradesh . . . . .	40	44	4	4
Madras . . . . .	40	44	4	4
Kerala . . . . .	20	22	2	2
TOTAL . . . . .	240	264	24	24

In addition to the staff indicated there will be a field officer and an assistant statistician in each State in officer's grade (corresponding to State Class II) as well as some ministerial staff.

3. The estimate of cost will be approximately as follows for the first two years :

	No.	First year (Rs.)	Second year (Rs.)
<b>Field staff:</b>			
Field officer . . . . .	7	42,000	42,000
Field supervisors . . . . .	24	86,400	86,400
Fieldmen . . . . .	264	396,000	396,000
<b>Statistical staff :</b>			
Assistant statisticians . . . . .	7	33,600	33,600
Computors . . . . .	24	57,600	57,600
Office staff, clerks, etc. . . . .	7	16,800	16,800
Peons . . . . .	7	8,400	8,400
<b>Contingencies :</b>			
Non-recurring—			
Crop-cutting equipment . . . . .		24,000	..
Calculating machines . . . . .		14,000	..
Recurring—			
Printing, stationery, postage . . . . .		20,000	20,000
Travelling allowance . . . . .		32,000	32,000
TOTAL . . . . .		730,800	692,800

4. The cost would thus be about Rs. 7 lakhs per year for the eastern and the southern rice zones taken together or roughly half that for each zone.



## ANNEXURE II

### *A Scheme to study Cost of Cultivation of Crops in the Wheat Region*

1. The main wheat-producing States of the country are U.P., Haryana, Punjab and Madhya Pradesh. The States of Jammu & Kashmir and Himachal Pradesh would also be included in this zone. Other important crops in this zone are sugarcane in U.P., Punjab and Haryana, cotton in Punjab and Madhya Pradesh, rice and oilseeds in U.P. and Madhya Pradesh, fruits in Himachal Pradesh, etc. The following important crops are proposed to be covered :

State	Crops covered
Uttar Pradesh . . . . .	Wheat, Sugarcane, Millets, Oilseeds, Rice, Potato.
Punjab & Haryana . . . . .	Wheat, Gram, Sugarcane, Cotton, Millets, Oilseeds.
Himachal Pradesh . . . . .	Potato, Maize, Fruits, Wheat, Pulses, Rice.
Jammu & Kashmir . . . . .	Rice, Maize, Rape & Mustard, Wheat, Pulses.
Madhya Pradesh . . . . .	Wheat, Cotton, Rice, Oilseeds, Millets.

2. The number of primary sampling units to be selected in each State and the field and the statistical staff required will be as follows :

State	No. of primary sampling units	Number of		
		Fieldmen	Field supervisors	Computors
Uttar Pradesh . . . . .	50	55	5	5
Punjab . . . . .	20	22	2	2
Haryana . . . . .	20	22	2	2
Himachal Pradesh . . . . .	20	22	2	2
Jammu & Kashmir . . . . .	20	22	2	2
Madhya Pradesh . . . . .	40	44	4	4
TOTAL . . . . .	170	187	17	17

3. From past experience it is noted that a sample of about 40 primary units is required to determine the cost of cultivation of principal crops with about 5% precision. Fewer units have been allotted to Punjab, Haryana, etc. in view of the small size of the States. In consequence, the precision of the State level estimate will be somewhat lower. However, the conditions of cultivation in adjoining States, e.g. Punjab and Haryana may not differ materially and an overall average for two or more States, which will be of sufficient precision, may be used with advantage in each of the States.

4. As in the rice region, in addition to the staff indicated in Annexure II a field officer, an assistant statistician, a clerk and a peon will be provided in each State. The estimate of cost based on these figures will be approximately as follows for this region :

	No.	Provision in rupees	
		First year	Second year
Field staff :			
Field officer . . . . .	6	36,000	36,000
Field supervisor . . . . .	17	61,200	61,200
Fieldmen . . . . .	187	280,500	280,500
Statistical staff :			
Assistant statisticians . . . . .	6	28,800	28,800
Computors . . . . .	17	40,600	40,600
Office staff :			
Clerks etc. . . . .	6	14,400	14,400
Peons . . . . .	6	7,200	7,200
Contingencies :			
Nor-recurring—			
Crop-cutting equipment . . . . .		17,000	..
Calculating machines . . . . .		12,000	..
Recurring—			
Printing, stationery, postage . . . . .		16,000	16,000
Travelling allowance . . . . .		25,000	25,000
TOTAL		538,700	509,700

5. The cost is thus seen to be of the order of Rs. 5 lakhs per year for the wheat region.

### ANNEXURE III

#### *A Scheme to study Cost of Cultivation of Crops in the Millets Region*

1. The States constituting this zone are Rajasthan, Gujarat, Maharashtra and Mysore. Apart from millets, important crops grown in this region are cotton and groundnut in Gujarat, Maharashtra and Mysore, sugarcane in Maharashtra, and rice in Maharashtra and Mysore. The following important crops are proposed to be covered :

State	Crops covered
Rajasthan . . . . .	Maize, Bajra, Wheat, Pulses, Oilseeds, Jowar.
Gujarat . . . . .	Groundnut, Other Oilseeds, Cotton, Bajra, Jowar, Wheat, Rice, Tobacco.
Maharashtra . . . . .	Sugarcane, Tobacco, Cotton, Jowar, Bajra, Groundnut, Rice.
Mysore . . . . .	Rice, Ragi, Cotton, Jowar, Groundnut, Sugarcane.

2. The number of primary sampling units to be selected in each State and the staff required are as follows :

State	No. of primary sampling units	Number of		
		Fieldmen	Field super- visors	Compu- tors
Rajasthan . . . . .	40	44	4	4
Gujarat . . . . .	40	44	4	4
Maharashtra . . . . .	40	44	4	4
Mysore . . . . .	30	33	3	3
TOTAL . . . . .	150	165	15	15

3. In addition to the above staff, a field officer, an assistant statistician, a clerk-cum-typist and a peon will also be provided in each State. The

estimate of cost based on this staff will be approximately as follows in this region :

	No.	Provision in rupees	
		First year	Second year
Field staff :			
Field officers . . . . .	4	24,000	24,000
Field supervisors . . . . .	15	54,000	54,000
Fieldmen . . . . .	165	247,500	247,500
Statistical staff:			
Assistant statisticians . . . . .	4	19,200	19,200
Computers . . . . .	15	36,000	36,000
Office staff :			
Clerks, etc. . . . .	4	9,600	9,600
Peons . . . . .	4	4,800	4,800
Contingencies :			
Non-recurring—			
Crop-cutting equipment . . . . .		15,000	..
Calculating machines . . . . .		8,000	..
Recurring—			
Printing, stationery, postage . . . . .		13,000	13,000
Travelling allowance . . . . .		20,000	20,000
TOTAL		451,100	428,100

The cost is thus of the order of Rs.  $4\frac{1}{2}$  lakhs per year for this region.

#### ANNEXURE IV

##### *Staff Requirement and Budget Provision necessary for the Cost of Cultivation Unit at the I.A.R.S.*

1. The statistical unit at the I.A.R.S. will be headed by a Deputy Statistical Adviser in the scale Rs. 1100—1400 who will be assisted by a Senior Statistician and a Statistician. A Programmer will also be provided to help in computer programming. Three Statistical Assistants will be required for preparing the data for mechanical processing and punching, verifying and other staff as shown below. The corresponding budget provision has also been worked out.

	Provision in rupees	
	First year	Second year
Deputy Statistical Adviser (1)	18,264	19,038
Senior Statistician (1)	12,300	12,914
Statistician (1)	7,644	7,644
Statistical Assistants (3)	13,722	14,205
Mechanical tab. staff:		
Programmer (1)	7,644	7,644
Key punch Operators & Verifiers (30)	83,430	85,202
Punch Supervisor (3)	9,243	9,470
Office staff :		
Stenographer, Clerk etc. and Peons (9)	22,877	23,388
Contingencies :		
Non-recurring	10,000	..
Recurring—		
Stationery (including hiring punching machines)	120,000	120,000
Travelling allowance	15,000	15,000
TOTAL	320,124	314,464

The cost would thus be about Rs. 3½ lakhs per year for the cost of cultivation unit at the I.A.R.S.